

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
14 October 2004 (14.10.2004)

PCT

(10) International Publication Number
WO 2004/087173 A3

(51) International Patent Classification⁷: **A61K 31/7032**,
A61P 29/00, 3/06

(21) International Application Number:
PCT/CA2004/000375

(22) International Filing Date: 12 March 2004 (12.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/404,095 2 April 2003 (02.04.2003) US

(71) Applicant (for all designated States except US): **MTI
META TECH INC.** [CA/CA]; 11249 University Avenue,
Edmonton, Alberta T6G 1Y7 (CA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CLANDININ,
Michael, Thomas** [CA/CA]; R.R.#4, Calmar, Alberta
T0C 0V0 (CA). **PARK, Eek, J.** [KR/CA]; #846, 11121-82
Avenue, Edmonton, Alberta T6G 0T4 (CA).

(74) Agents: **SILVER, Gail, C. et al.**; Borden Ladner Gervais
LLP, World Exchange Plaza, 100 Queen Street, Suite 1100,
Ottawa, Ontario K1P 1J9 (CA).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- with amended claims and statement

(88) Date of publication of the international search report:
25 November 2004

Date of publication of the amended claims and statement:
17 February 2005

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: FORMULATIONS FOR MEDIATING INFLAMMATION AND FOR REDUCING BLOOD CHOLESTEROL

(57) Abstract: The invention provides formulations for mediating inflammation and for lowering blood cholesterol. For example, inflammation of the intestine, retina or neural tissues, may be mediated. Further the formulations are effective in decreasing blood cholesterol absorption. The formulations comprise at least one ganglioside, which may be selected from the group consisting of: GD3, GM1, GM2, GM3, GD1b, NANA, and sialic acid. The invention further provides a method of treating or preventing inflammatory diseases by delivery of at least one ganglioside to a subject in need thereof, and a method of reducing blood cholesterol in a subject by delivery of a ganglioside-containing formulation. The formulation of the invention may be used to supplement foods or liquids, and may for example be used in preparation of infant formula or foods.

WO 2004/087173 A3

AMENDED CLAIMS

received by the International Bureau on 13 December 2004 (13.12.04)
original claims 1-28, replaced by amended claims 1-27

1. A formulation comprising one or more gangliosides selected from the group consisting of GD3, GM2, GM3, GD1b, NANA, and sialic acid, for mediating inflammation.
2. The formulation of claim 1, comprising the ganglioside GD3.
3. The formulation of claim 1 or 2, comprising the ganglioside GM3.
4. The formulation of any one of claims 1 to 3, wherein the percentage of GD3 as a function of total gangliosides is at least 50% by weight.
5. The formulation of any one of claims 1 to 3, wherein the percentage of GM3 as a function of total gangliosides is at least 50% by weight.
6. The formulation of claim 1, comprising 70-90% GD3 and 0-15% GM3 by weight based on total gangliosides.
7. The formulation of claim 1 comprising about 80% GD3 and about 5% GM3 by weight based on total gangliosides.
8. The formulation of any one of claims 1 to 7, wherein mediating inflammation comprises mediating inflammation of the intestine, retina, or neuronal tissue.
9. The formulation of any one of claims 1 to 8, wherein mediating inflammation comprises preventing or treating an inflammatory disease.
10. The formulation of claim 9, wherein said inflammatory disease is selected from the group consisting of inflammatory bowel disorders, disorders arising from allergic responses, and diseases involving epithelial surface responses.

11. The formulation of any one of claims 1 to 10, in the form of a supplemented liquid or food.
12. The formulation of claim 11, wherein said supplemented liquid or food comprises infant formula or infant foods.
13. A method for mediating inflammation in a subject in need thereof comprising the step of providing the formulation of any one of claims 1-12 to said subject for oral consumption.
14. Use of the formulation of any one of claims 1-12 for the manufacture of a medicament for mediating inflammation.
15. The use of claim 14, wherein the medicament is formulated for oral administration.
16. A formulation comprising one or more gangliosides selected from the group consisting of GD3, GM2, GM3, GD1b, NANA, and sialic acid, for reducing plasma cholesterol level.
17. The formulation of claim 16, comprising the ganglioside GD3.
18. The formulation of claim 16, comprising the ganglioside GM3.
19. The formulation of any one of claims 16 to 18, wherein the percentage of GD3 as a function of total gangliosides is at least 50% by weight.
20. The formulation of any one of claims 16 to 18, wherein the percentage of GM3 as a function of total gangliosides is at least 50% by weight.

21. The formulation of claim 16, comprising 70-90% GD3 and 0-15% GM3 by weight based on total gangliosides.
22. The formulation of claim 16, comprising about 80% GD3 and about 5% GM3 by weight based on total gangliosides.
23. The formulation of any one of claims 16 to 22, in the form of a supplemented liquid or food.
24. The formulation of claim 23, wherein said supplemented liquid or food comprises infant formula or infant foods.
25. A method for reducing plasma cholesterol level in a subject in need thereof comprising the step of providing the formulation of any one of claims 16-24 to said subject for oral consumption.
26. Use of the formulation of any one of claims 16-24 for the manufacture of a medicament for reducing plasma cholesterol level.
27. The use of claim 26, wherein the medicament is formulated for oral administration.

DECLARATION SELON L'ARTICLE 19 (1)

The claims have been amended to more clearly define the invention, by limiting to specific gangliosides in the broad claims and by excluding GM1.